King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math-302 Semester-133 QUIZ I

NAME: S.No. ID:

Maximum Marks: 15 Section:02 Time Allowed: 30 minutes

(1) Given the position vector $\overrightarrow{r}(t) =< 2\sqrt{2}\ t, e^{2t}, e^{-2t} >$ of a curve C:

(a) Find a unit tangent vector to the curve at $t = 0$.

(b) Find the length of the curve for $0 \leq t \leq 1$.

(2) If $f(x, y) = x^2 + xy + y^2 - x$, find all points where $D_{\overrightarrow{u}} f(x, y)$ in the direction of $\overrightarrow{u} =< \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} >$ is zero.